

Abstract Submitted
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Detection of $N_2(A^3\Sigma_u^+)$ metastable in DBD discharge by OODR-LIF spectroscopy¹ SANTOLO DE BENEDICTIS, PAOLO FRANCESCO AMBRICO, GIORGIO DILECCE, Institute of Inorganic Methodologies and Plasmas, CNR, Bari, Italy, MILAN SIMEK, Institute of Plasma Physics, Laboratory of Pulse Plasma Systems, Prague, Czech Republic — The $N_2(A^3\Sigma_u^+)$ metastable has been detected for first time in dielectric barrier discharge at atmospheric pressure in N_2 and N_2 - O_2 gas mixtures by Optical-Optical Double Resonance –Laser Induced Fluorescence spectroscopy (OODR-LIF). The DBD discharge occurs over a thin ceramic plate on which one metallic electrode comb structured is deposited. The second electrode is a full deposit on the back of the plate external to the chamber. The $N_2(A)$ OODR-LIF detection takes place by one laser photon tuned on the (3,0) band of N_2 (FPS) and a second one on the (2,3) band of N_2 (SPS) as described in previous papers[1]. The fluorescence signal of (2,1) band of SPS is measured. The measurement is time resolved in the radiofrequency cycle (11KHz) of applied voltage and space resolved in the discharge gap. $N_2(A)$ metastable LIF signal varies in the voltage cycle as well as with the distance (1 - 5 mm) above the surface of comb electrode. It is significantly quenched as a few percentage of O_2 is added to N_2 . [1] G. Dilecce, P.F. Ambrico, S. De Benedictis, PSST (on line July 2005)

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